

REMARKS/ARGUMENTS

Claims 30-38 are active in this application. Claims 30 and 38 have been amended to clarify that not more than one X is reacted with the matrix material. Support for this amendment is found in cancelled claim 20 and the specification on page 2.

No new matter is added by these amendments.

As described on page 2 of the specification, the Inventors have discovered, surprisingly, that limiting the reaction of one X group to the matrix provides a number of benefits including particle size of less than 20 nm and less agglomeration. These characteristics are particularly advantageous in terms of the suitability of using such nanofillers in plastic processing. In fact, in the Examples section of the specification, the Inventors have shown that the claimed nanofillers, raise tensile modulus of plastics, markedly improve softening temperature and thermal stability and tensile shear strength, and scratch resistance (see pages 19-22 of the specification).

The cited prior art neither describes the types of materials claimed (i.e., the limitation of reacting the X per cluster unit with the matrix material) nor sought to address the problems identified and solved by the present invention. Accordingly, the claims would not have been anticipated by nor rendered obvious by the cited publications. Further comments on these points follow.

In the Office Action, the Examiner has rejected Claims 30-35 and 38 as being the same as the material described in U.S. patent nos. 5,412,053 and 5,484,867 ("the Lichtenhan patents"). Both patents appear to describe polyhedral oligomeric silsesquioxane covalently joined to another polymer, e.g., silicone polymer in the '053 patent (Example 1, cols. 6-7) or polymer with terminal vinyl or hydride groups in the '867 patent (col. 4, lines 13-31). The Examiner has acknowledged that neither of these Lichtenhan patents describes the particle size of the nanofiller. Nonetheless, the Examiner believes that the size is inherent from the

description of the material in the Lichtenhan patents. Specifically, the Examiner has based this conclusion on two things (1) the material in the Lichtenham patents are the same and thus have the same properties, including particle size; and (2) the disclosure in U.S. patent no. 6,716,919 in col. 2, lines 42-49 which states that the material in the Lichtenham patents “can range in diameter from 0.5 nm to 50 nm.” However, neither of these patents describe nor suggest limiting the reaction between the X substituent and the matrix in the manner claimed nor do the patents describe why one would do so or the surprising results obtained (as discussed on page 2 of the specification).

The Examiner has also rejected all of the claims in view of U.S. patent no. 6,297,301 (Laine), which appears to also describe polyhedral oligomeric silsesquioxane joined to a silicone oxide matrix, as an example (see Figure 16). For the same reasons discussed above pertaining to the Lichtenham patents, Laine also does not describe limiting the reaction between the X substituent and the matrix in the manner claimed. In fact, in Figure 16 of Laine, several reactions between the silicone oxide matrix and the oxy groups of the oligomeric material are shown.

Furthermore, while the Lichtenham patents and the Laine patent suggest that the particle sizes can range anywhere up to 50 nm (Lichtenham) and 100 nm (Laine) there is simply no teaching and therefore, no motivation, to limit the reactive X site with the matrix as claimed. Therefore, it is requested that the rejections under section 102 be withdrawn.

The rejection of the claims in view of three co-pending applications: 10/511,593, 10/887,103, and 10/886,621 is requested to be held in abeyance since the alleged conflicting claims have not yet been patented (see MPEP § 822.01).

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In view of the above, Applicants request a Notice of Allowance indicating Claims 30-38 have been allowed.

Respectfully submitted,

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